

CLAIMS

1. (currently amended) A network element [(1)] for setting up wireless networks [(3)] for wireless data exchange between network elements [(1)] and/or network users [(2)], wherein the network element [(1)] has a transmitting/receiving unit [(12)] for wirelessly transmitting and receiving data, a control unit [(11)] for controlling the processing of data and a data memory [(15)],

characterized in that the control unit [(11)] is adapted to evaluate connection path information [(22)] and connection state information [(21)] for data exchange between network elements [(1)] and/or network users [(2)] in order to determine partial sections of data transmission routes and/or complete data transmission routes for transmitting or forwarding data, wherein the connection path information [(22)] specifies the number of the network elements [(1)] and the neighborhood relationships of the network elements [(1)] of the network and the connection state information [(21)] specifies the state of the connection between network elements [(1)] and/or network users [(2)].

2. (currently amended) A network element as set forth in claim 1

characterized in that the control unit [(11)] is adapted to evaluate connection state information [(21)] and connection path information [(22)] stored in the data memory [(15)] and/or connection state information [(21)] and connection path information [(22)] contained in the data intended for the data exchange.

3. (currently amended) A network element as set forth in claim 1 ~~or claim 2~~

characterized in that the connection path information [(22)] stored in the data memory [(15)] specifies the number of the network elements [(1)] and the neighborhood relationships of the network elements [(1)] of the entire network [(3)] and the connection state information [(21)] specifies the state of the connection between network elements [(1)] and/or network users [(2)] of the entire network [(3)].

4. (currently amended) A network element as set forth in ~~one of the preceding claims~~ claim 1

characterized in that the data memory [(15)] is adapted for storage of an item of authentication information [(23)] which is present only a single time for each network element [(1)] and the control unit [(11)] is adapted to transmit the authentication information [(23)] by means of the transmitting/receiving units [(12)] to other network elements [(1)] and to evaluate the items of authentication information [(23)] received from other network elements [(1)] for checking the entitlement of the other network elements [(1)] of the network for data exchange in the network [(3)].

5. (currently amended) A network element as set forth in ~~one of the preceding~~
claims claim 1

characterized in that the data memory [(15)] is adapted for the storage of an item of authorization information [(24)] which is unique in the network, in particular an item of address information, which is characterizing in respect of each network user [(2)] and each network element [(1)] in the network, and the control unit [(11)] is adapted to transmit the authorization information [(24)] by means of the transmitting/receiving units [(12)] to other network elements [(1)] and to evaluate the authorization information [(24)] received from other network elements [(1)] to determine at least partial sections of data transmission routes in the network [(3)].

6. (currently amended) A network element as set forth in ~~one of the preceding~~
claims claim 1

characterized by a first transmitting/receiving unit [(12)] for the data exchange of network elements [(1)] with each other and a second transmitting/receiving unit [(12)] for data exchange between network elements [(1)] and network users [(2)].

7. (currently amended) A network element as set forth in ~~one of the preceding~~
claims claim 1

characterized by coupling means ~~(202, 203)~~ for coupling the network element [(1)] for data exchange with a second network [(4)], in particular a non-wireless infrastructure network like the Internet.

8. (currently amended) A network element as set forth in ~~one of the preceding~~
claims claim 1

characterized by coupling means [(204)] for coupling of the network element [(1)] to a plurality of different energy sources, in particular solar cells.

9. (currently amended) A network element as set forth in claim 7 characterized in that the coupling means ~~(202, 203)~~ for data exchange are adapted also to supply the network element [(1)] with energy by means of the coupling means ~~(202, 203)~~ for data exchange, in particular by means of an Ethernet connection [(202)] for a non-wireless infrastructure network [(4)].

10. (currently amended) A network element as set forth in ~~one of the preceding claims~~ claim 1 characterized by at least one transmitting/receiving unit [(12)] in accordance with one or more of the standards IEEE 802.11a, IEEE 802.11b and IEEE 802.11g.

11. (currently amended) A network element as set forth in ~~one of the preceding claims~~ claim 1 characterized in that it has one or more WLAN PCI-cards [(300)] in accordance with one or more of the standards IEEE 802.11a, IEEE 802.11b and IEEE 802.11g, volatile and non-volatile memories ~~(403, 405)~~, in particular SDRAMs or flash memories, a microprocessor or microcomputer unit and/or programmable logic components ~~(400, 401, 402)~~, for regulating and controlling power loss and the energy sources and two antennae respectively for data of network users [(2)] and network elements [(1)].

12. (currently amended) A method of setting up wireless networks [(3)] for data exchange between network elements [(1)] and/or network users [(2)] comprising the steps:

- exchanging and storing connection path information [(22)] and connection state information [(21)] of the network elements [(1)] relative to each other and of the network users [(2)] relative to the network elements [(1)],
- evaluating the connection path information [(22)] and connection state information [(21)],
- exchanging data between network elements [(1)] and/or network users [(2)] based on the items of connection path information [(22)] and items of connection state information [(21)], by dispatching data through a first network user

[[(2)]] to a network element [[(1)]] arranged in the proximity, and

- receiving the data through the network element [[(1)]] and further dispatching the data in relation to an adjacent network element [[(1)]] in a direction towards the addressed second network user [[(2)]] or the addressed network user [[(2)]] itself by way of a data transmission route ascertained (~~21, 22~~) from the connection state and connection path information or a partial section of a data transmission route.

13. (currently amended) A method as set forth in claim 12 characterized by finding network elements [[(1)]] and network users [[(2)]] by wirelessly receiving and emitting connection enquiries.

14. (currently amended) A method as set forth in claim 12 ~~or claim 13~~ characterized by checking the authenticity of the found network elements [[(1)]] by evaluation of a sent item of authenticity information [[(12)]] for ascertaining the entitlement for data exchange and storage of the entitlement information ascertained therefrom.

15. (currently amended) A method as set forth in ~~one of claims 12 and 14~~ claim 12

characterized by the steps of transmitting, receiving, allocating and storing in the network unique authorization information [[(24)]], in particular address information of network elements [[(1)]] and network users [[(2)]].

16. (currently amended) A method as set forth in claim 15 characterized by handing over network users [[(2)]] from the transmitting/receiving region [[(7)]] of a first network element [[(1)]] into the transmitting/receiving region [[(7)]] of a second network element [[(1)]] in dependence on the connection state information [[(21)]] and the connection path information [[(22)]] while retaining the unique authorization information [[(24)]] associated with the network user [[(2)]].

17. (currently amended) A method as set forth in ~~one of claims 12 through 16~~ claim 12

characterized by adding network element [(1)] to the transmitting/receiving region [(7)] of network elements [(1)] already arranged in the network[(3)].

18. (currently amended) A method as set forth in ~~one of claims 12 through 17~~claim 12

characterized by distinguishing and separating the wireless data exchange in accordance with network users [(3)] and network elements[(1)], in particular by using different frequency ranges, allotting frequency channels, time multiplexing and/or different modulation methods and/or standards of wireless data transmission for data exchange between network users [(2)] and data exchange only between network elements[(1)].

19. (currently amended) A method as set forth in ~~one of claims 12 through 18~~claim 18

characterized by coupling a plurality of network elements [(1)] to a second network[(4)], in particular a non-wireless infrastructure network like the Internet.

20. (currently amended) A method as set forth in ~~one of claims 12 through 19~~claim 12

characterized by

- provision of a predefined limited number of items of authorization information (24) for network users[(2)], which is the same in all network elements [(1)],
- the detection of an association event by a network element[(1)], which indicates that a network user [(2)] is within the transmission/reception range of a network element[(1)],
- comparison of the communicated authorization information (24) with the predefined known items of authorization information[(24)],
- evaluation of the comparison to ascertain whether this is an external network user (2) or a network user who is already known,
- assignment of an item of authorization information [(24)] when an external network user [(2)] has been ascertained,

- communicating the connection path and/or connection state information (~~21, 22~~) related to the network user $[(2)]$ to the network elements $[(1)]$ of the network, and

- communicating an item of authorization information to the network user, which is characteristic of the network, in particular address information for data transmission.

21. (currently amended) A network having network elements $[(1)]$ as set forth in ~~one of claims 1 through 11~~claim 1 for setting up wireless networks $[(3)]$ for network users $[(2)]$ according to a method as set forth in one of claims 12 through 19, wherein the data exchange between two or more network users $[(2)]$ is always effected at least by means of a network element $[(1)]$ and on the basis of the connection state and the connection path information (~~21, 22~~).

22. (currently amended) A network as set forth in claim 21 characterized in that the spatial distance of the network elements $[(1)]$ is substantially less than the range of the transmitting/receiving units (~~42, 7~~) of the network elements.

23. (currently amended) A network as set forth in ~~one of claims 21 and 22~~claim 21

characterized in that inter-related data can be stored distributedly in the data memories $[(15)]$ of a plurality of network elements $[(1)]$.